AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (canceled).

2. (original): A shape descriptor extracting method comprising:

(a) extracting a skeleton from an input image;

(b) obtaining a first list of straight lines by connecting pixels based on the extracted skeleton; and

(c) determining a second list of straight lines obtained by normalizing the first list of straight lines as a shape descriptor.

3. (original): The method of claim 2, wherein the step (a) comprises:

(a-1) obtaining a distance map by performing a distance transform on the input image; and

(a-2) extracting a skeleton from the obtained distance map.

4. (original): The method of claim 2, wherein the step (b) comprises:

(b-1) thinning the extracted skeleton; and

(b-2) extracting straight lines by connecting respective pixels within the thinned skeleton.

5. (original): The method of claim 2, wherein the step (c) comprises:

(c-1) making a list of starting points and ending points of the connected lines;

(c-2) obtaining a first list of straight lines by a straight line combination of the extracted straight lines; and

(c-3) determining a second list of straight lines, obtained by normalizing the first list of straight lines based on the maximum distance between ending points of respective straight lines, as a shape descriptor.

6. (original): The method of claim 3, wherein the distance transform is based on a function indicating respective points within an object with the minimum distance value of the corresponding point from the background.

7. (original): The method of claim 2, wherein the step (a-2) comprises: obtaining a local maximum from the distance map using an edge detecting method.

8. (original): The method of claim 7, wherein the step (a-2) comprises:

(a-2-1) performing a convolution using a local maximum detecting mask of four directions to obtain a local maximum.

9. (original): The method of claim 5, after the step (a-2-1), further comprising:

(a-2-2) recording a label corresponding to a direction having the greatest size on a direction map and a magnitude map.

10. (original): The method of claim 2, wherein the input image is a binary image.

11. (original): The method of claim 4, wherein the step (b-1) comprises:

leaving a pixel having the greatest size in a direction rotated by 90-degrees from the corresponding direction on the direction map, and removing the rest of the pixels.

12. (original): The method of claim 8, wherein the step (c-2) comprises:

using the direction map of four directions, and making a list of starting points and ending points of respective line segments by connecting pixels having the same label on the direction map.

13. (original): The method of claim 2, wherein the step (c-2) comprises:

performing a straight line combination by changing threshold values of an angle between the straight lines, a distance, and a length of a straight line from the obtained first list of straight lines.

14. (original): The method of claim 13, wherein the straight line combination is repeated until the number of remaining straight lines becomes equal to or less than a predetermined number.

15. (original): An image searching method, wherein a method for searching for images having similar shapes to a query image comprises:

(a) obtaining a list of straight lines from a shape descriptor of a query image;

(b) comparing the list of straight lines of a shape descriptor of a detected image with the list of straight lines of the shape descriptor of the query image, and obtaining dissimilarity; and

(c) detecting images having similar shapes to the query image based on the obtained dissimilarity.

16. (original): The method of claim 15, wherein the step (b) comprises:

(b-1) measuring distances between ending points of the straight lines forming the skeleton; and

(b-2) determining the sum of minimum values of the measured distances as dissimilarity.

17. (original): The method of claim 15, wherein the step (b-1) comprises:

when Q is a straight line for detecting, M is a detected straight line, S is a starting point of any straight line, E is an ending point of any straight line, N_Q is the total number of the straight lines which the shape descriptor of the query image has, N_M is the total number of the straight

lines which the shape descriptor of the detected image has, and N is $N = \min\{N_Q, N_M\}$

calculating distances between ending points of the straight lines forming the skeleton according to

$$D_{1k} = \min_{ij}\left\{\left\|Q_{S_i} - M_{S_j}\right\| + \left\|Q_{E_i} - M_{E_j}\right\|\right\} D_{2k} = \min_{ij}\left\{\left\|Q_{S_i} - M_{S_j}\right\| + \left\|Q_{E_i} - M_{E_j}\right\|\right\}$$

and the step (b-2) comprises:

measuring dissimilarity using a dissimilarity specific function defined as

$$D = \sum_{k=0}^{N-1} \min\{D_{1k}, D_{2k}\}.$$

18. (original): The method of claim 17, wherein a similarity measurement is performed according to the steps (b-1) and (b-2) at regular intervals of a rotating angle to obtain a value which is not changed by the rotation.

19. (original): A dissimilarity measuring method, wherein a method for measuring dissimilarity between images indexed using a shape descriptor formed on the basis of a skeleton comprises:

(a) obtaining a list of straight lines from a shape descriptor of a query image; and

(b) comparing a list of straight lines from a shape descriptor of a detected image with the list of straight lines of a shape descriptor of a query image, and obtaining dissimilarity.

Please add the following new claim:

20. (new): The method of claim 2, wherein the step (a) comprises:

(a-1) obtaining a map of the input image; and

(a-2) extracting the skeleton from the obtained map.